



2022 & 2026 Final LCR Study Results Sierra Area

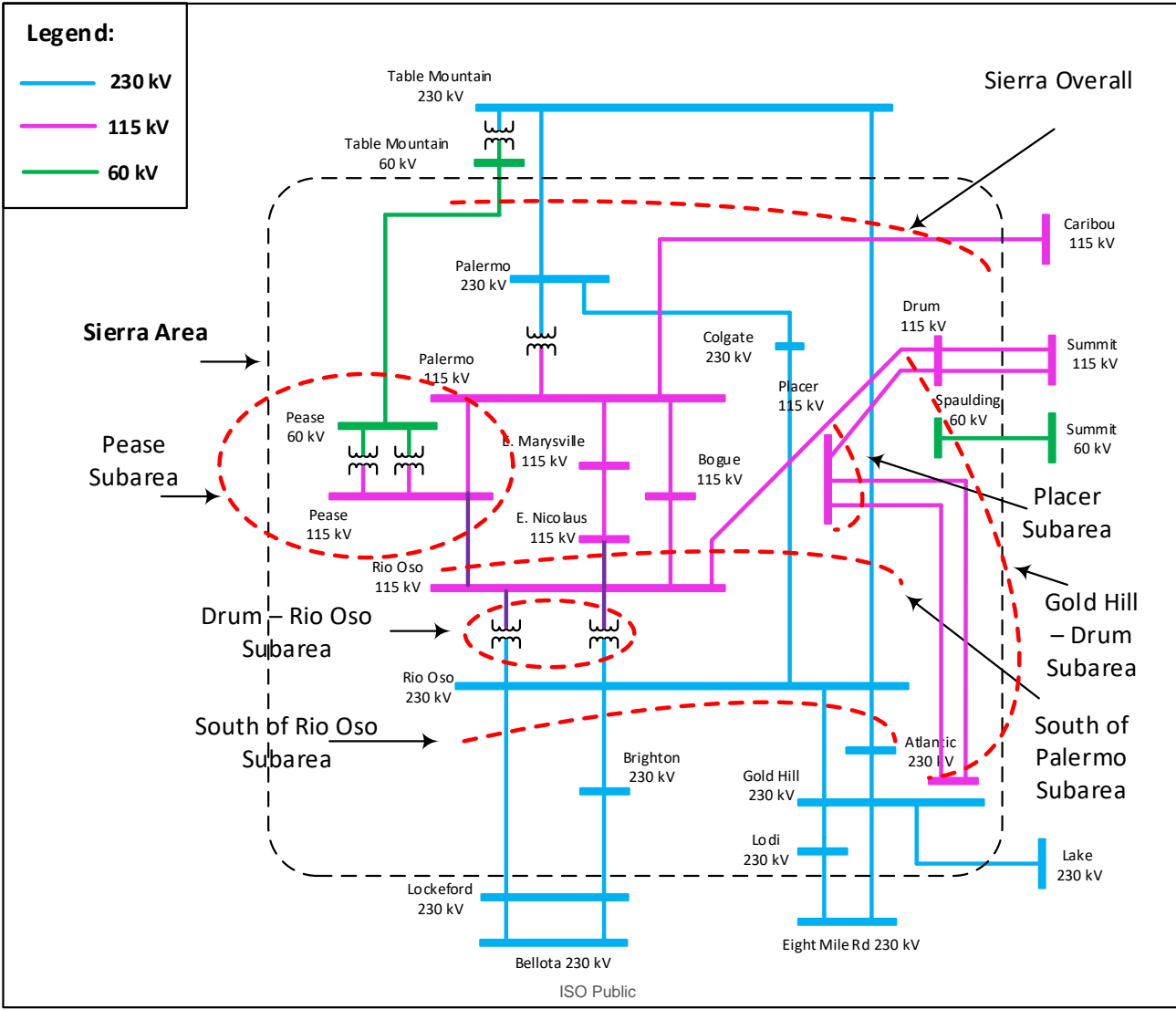
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Regional Transmission Engineer Lead

Stakeholder Call

April 7, 2021

Sierra Area Transmission System & LCR Sub-areas



New major transmission projects

Project Name	Expected ISD
Year 2022	
South of Palermo 115 kV Reinforcement Project	2021
Year 2026	
Rio Oso 230/115 kV Transformer Upgrades	Oct-23
Rio Oso Area 230 kV Voltage Support	Jul-24

Power plant changes

Additions:

- Grizzly Unit #1 due to the POI change.

Retirements:

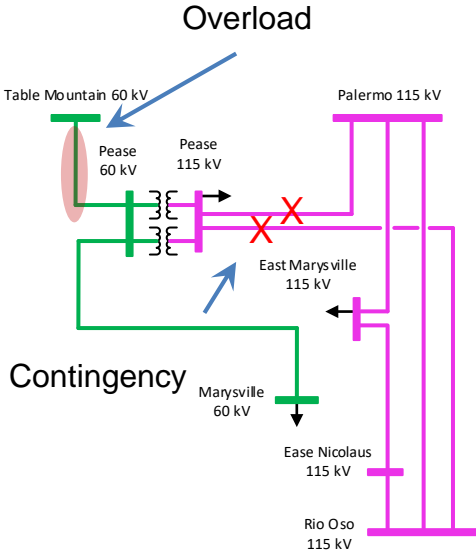
- No new retirements

Sierra Area Overall: Load and Resources

Load (MW)	2022	2026	Generation (MW)	2022	2026
Gross Load	1,564	1,834	Market/ Net Seller/ Battery	894	894
AAEE	-13	-25	Solar	5	5
Behind the meter DG	0	11	Wind	0	0
Net Load	1,551	1,798	Muni	1,142	1,142
Transmission Losses	67	81	QF	51	51
Pumps	0	0	Future preferred resource and energy storage	0	0
Load + Losses + Pumps	1,619	1,880	Total Qualifying Capacity	2,092	2,092

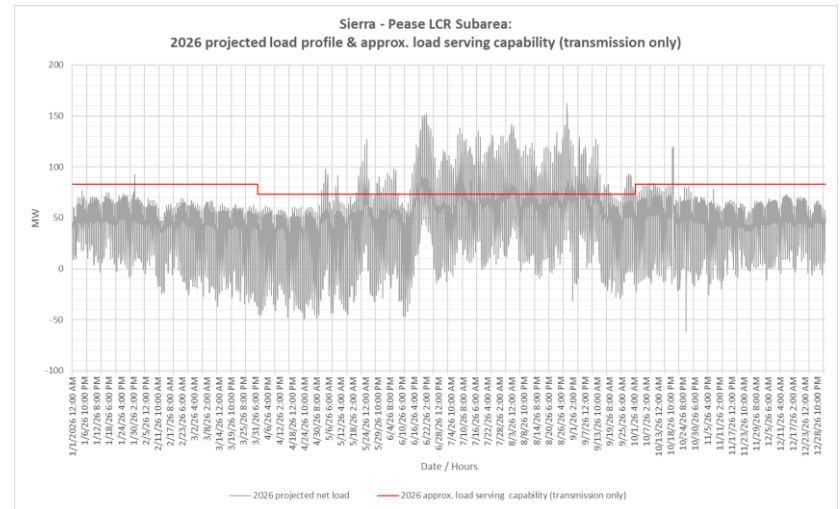
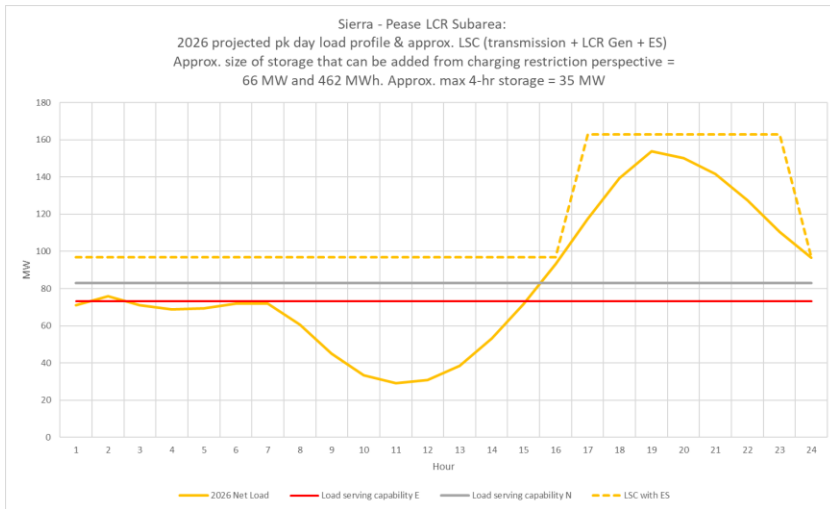
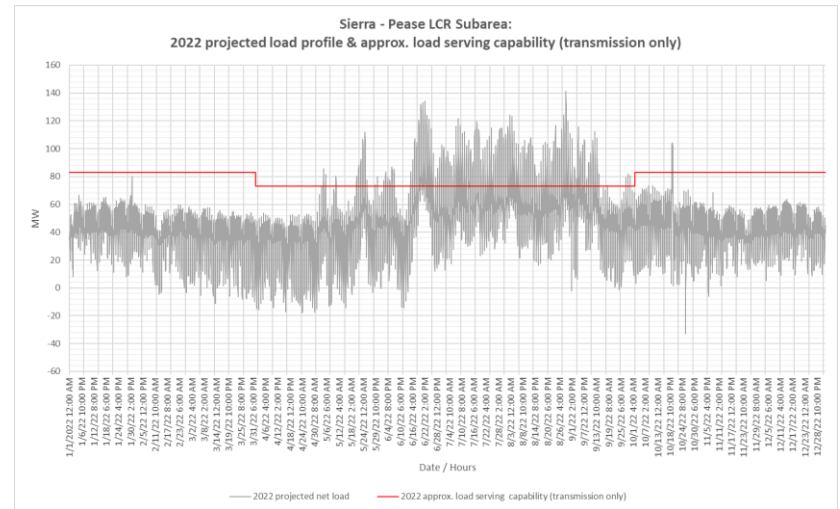
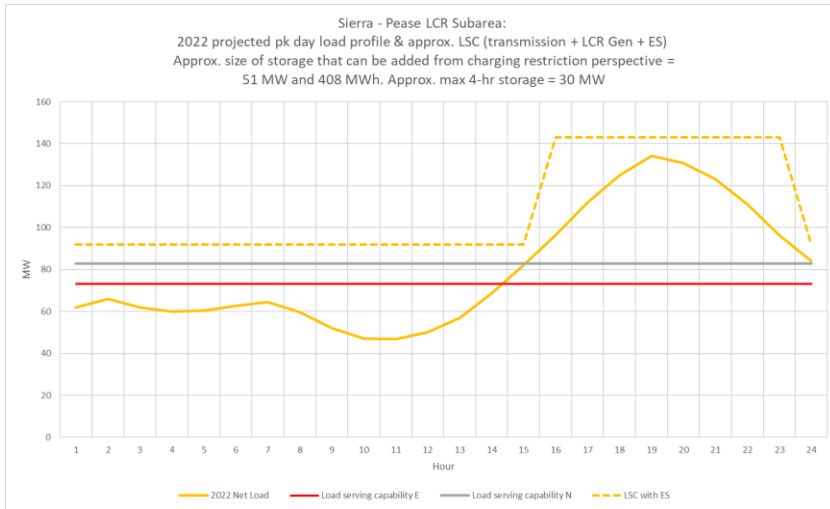
Pease Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2022	P6, P7	Table Mountain – Pease 60 kV line	Palermo – Pease 115 kV and Pease – Rio Oso 115 kV	60
2026	P6, P7	Table Mountain – Pease 60 kV line	Palermo – Pease 115 kV and Pease – Rio Oso 115 kV	80

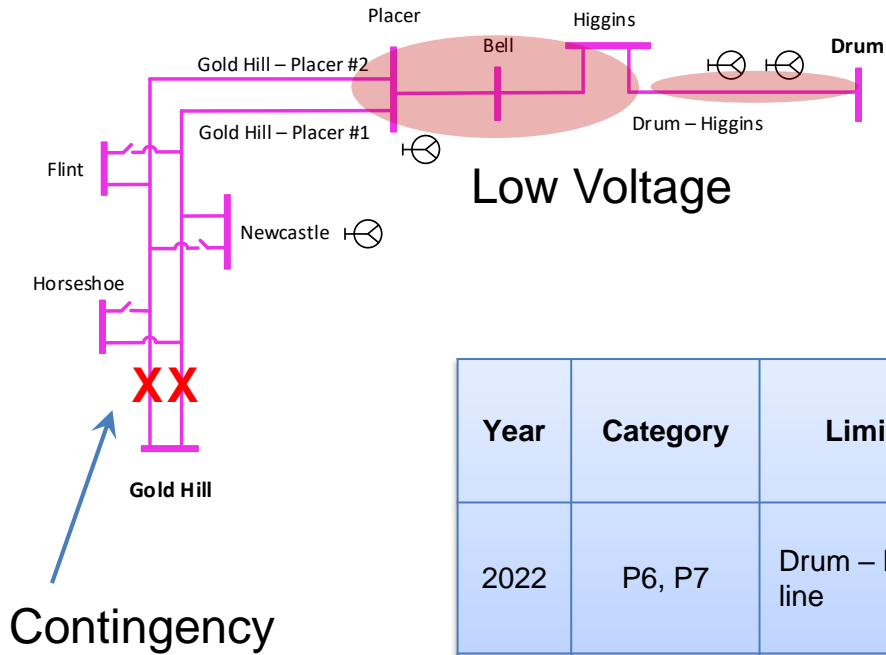


ISO Public

Pease Sub-area: Load Profiles

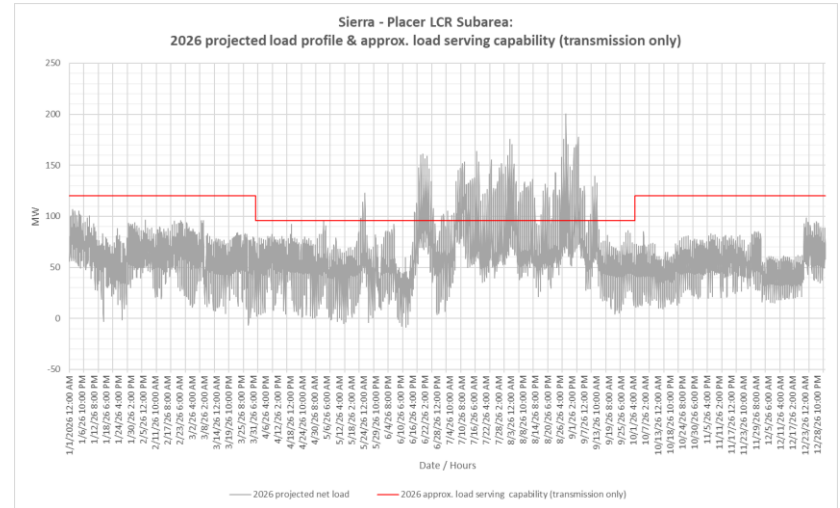
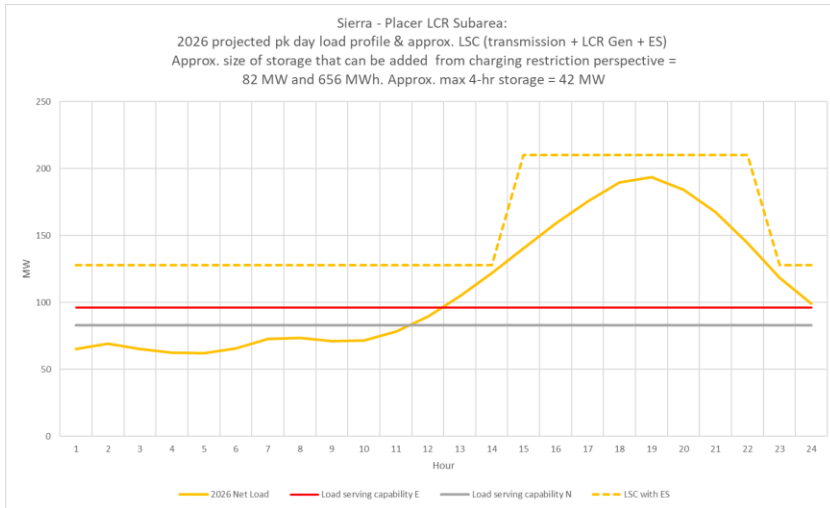
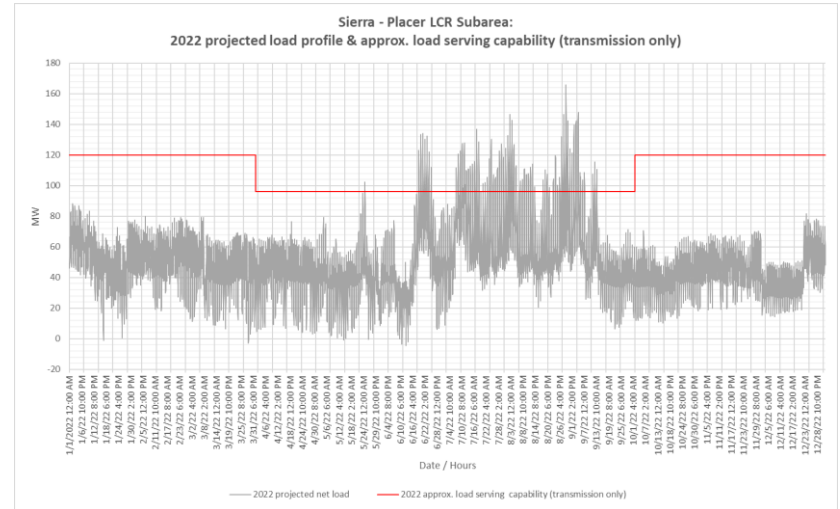
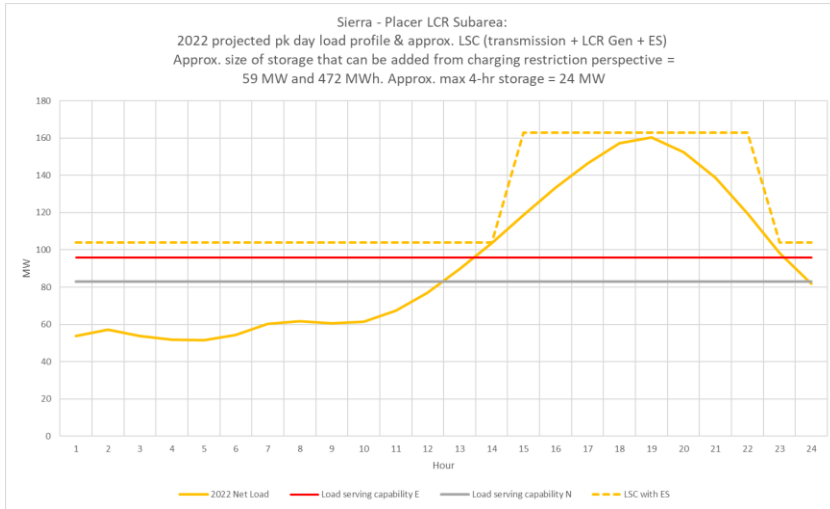


Placer Sub-Area: Requirements



Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2022	P6, P7	Drum – Higgins 115 kV line	Gold Hill – Placer #1 and #2 115 kV lines	80
2026	P6, P7	Low voltage at Placer, Bell, and Higgins 115 kV buses	Gold Hill – Placer #1 and #2 115 kV lines	127 (30)

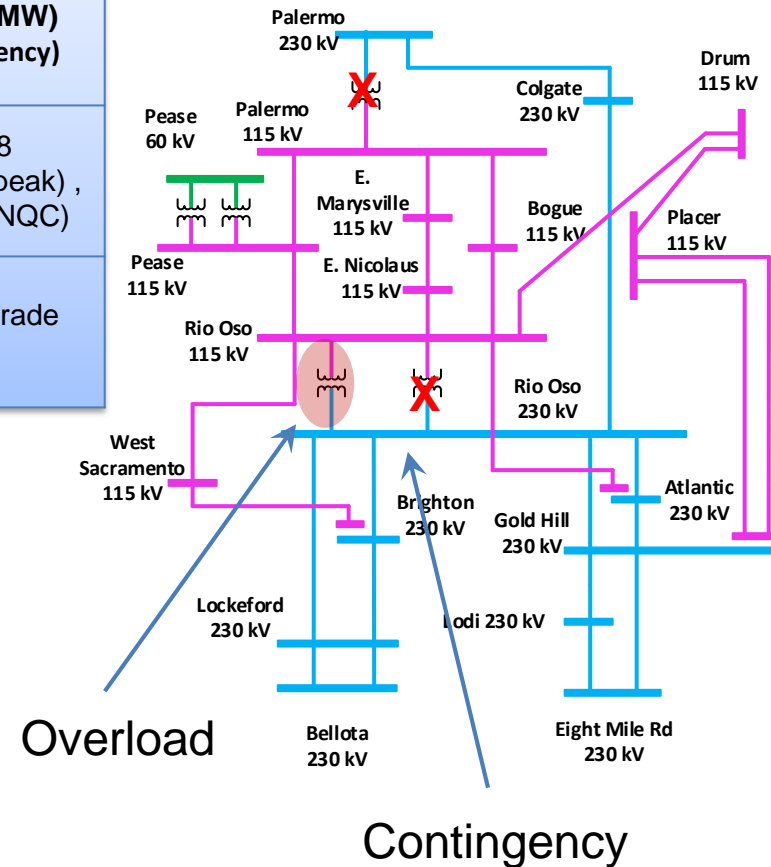
Placer Sub-area: Load Profiles



Drum – Rio Oso Sub-Area: Requirements

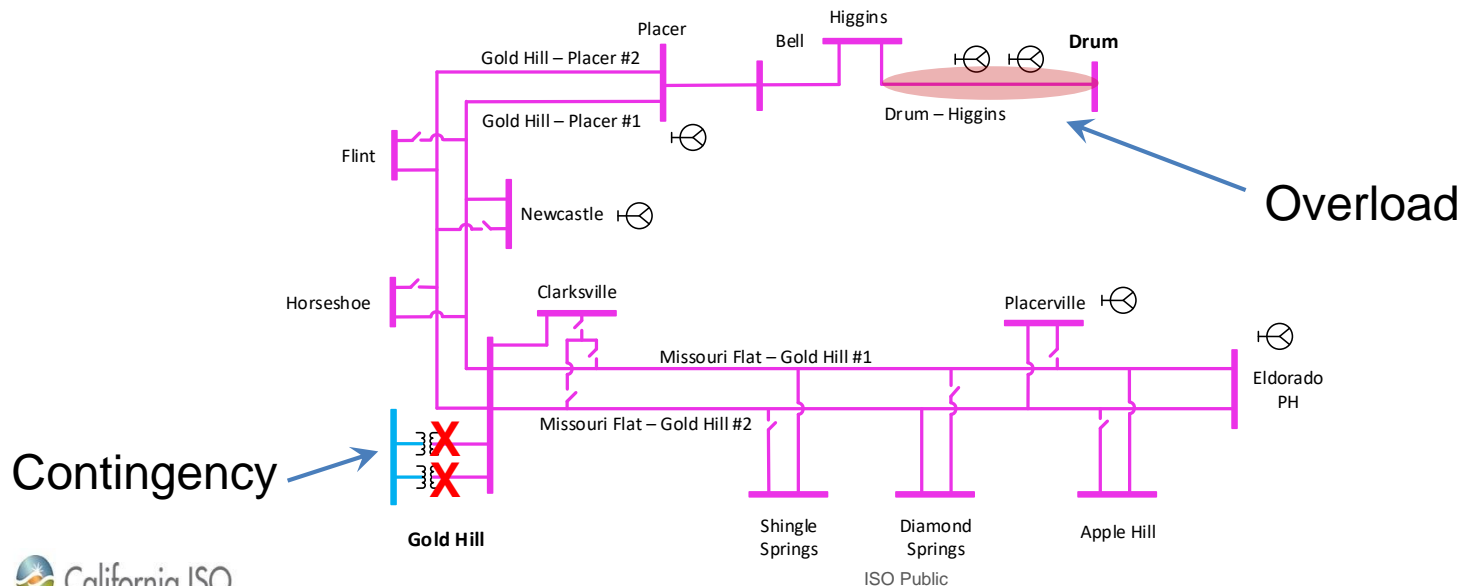
Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2022	P6	Rio Oso 230/115 kV #1 Transformer	Rio Oso 230/115 kV #2 and Palermo 230/115 kV #2 Transformers	748 (192 at peak) , 187 at NQC)
2026	All	No requirement due to Rio Oso 230/115 kV Transformer Upgrade project		

- The reason for significant increase in the LCR of this sub-area compared to last year is that the summer emergency rating of Bank #1 has reduced from 144 MVA to 92 MVA.
- While the deficiency values in the table are based on P6 contingencies, the sub-area is deficient even for P1 contingency of Palermo 230/115 kV TB #2

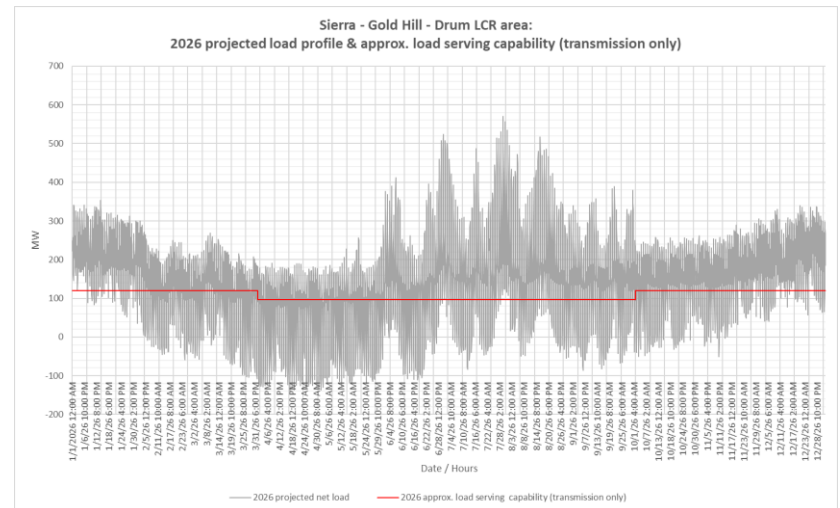
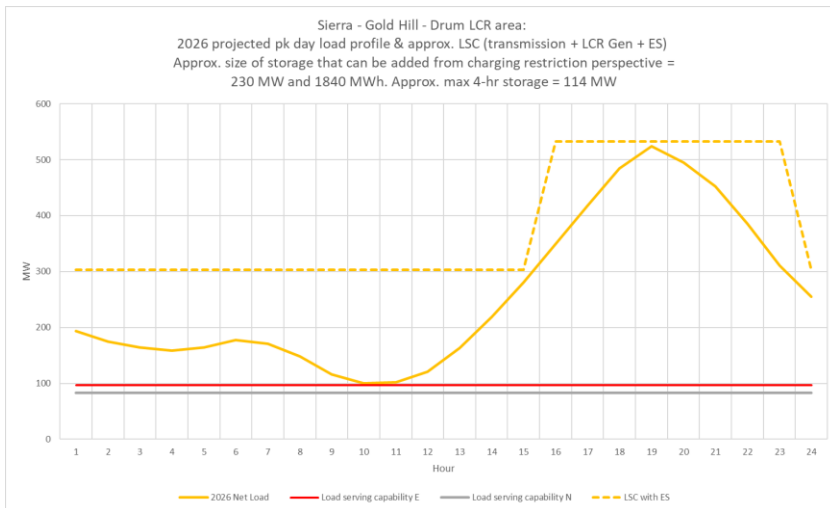
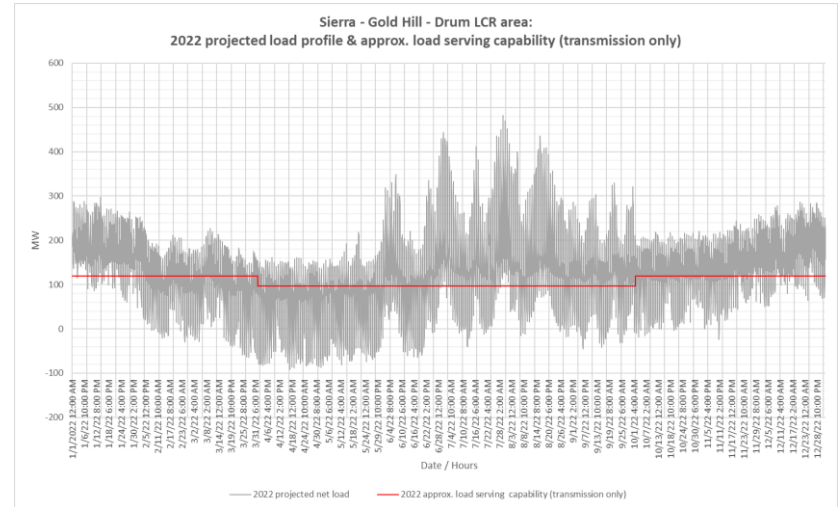
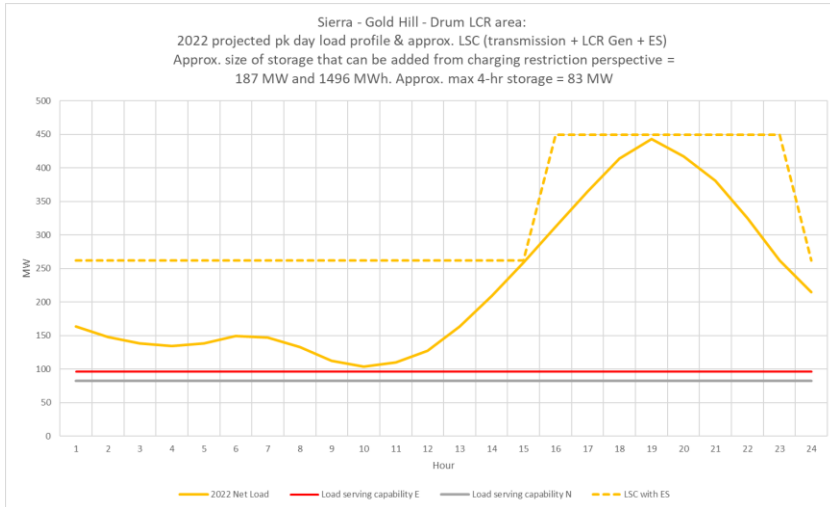


Gold Hill - Drum Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2022	P6	Drum – Higgins 115 kV	Gold Hill 230/115 kV #1 and Gold Hill 230/115 kV #2 Transformers	366 (276)
2026	P6	Drum – Higgins 115 kV	Gold Hill 230/115 kV #1 and Gold Hill 230/115 kV #2 Transformers	450 (331)

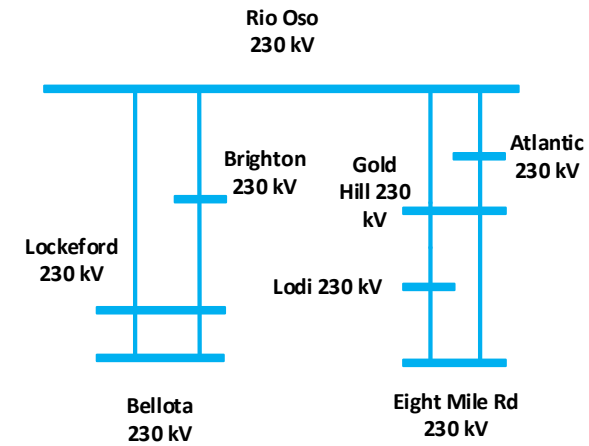


Gold Hill - Drum Sub-area: Load Profiles



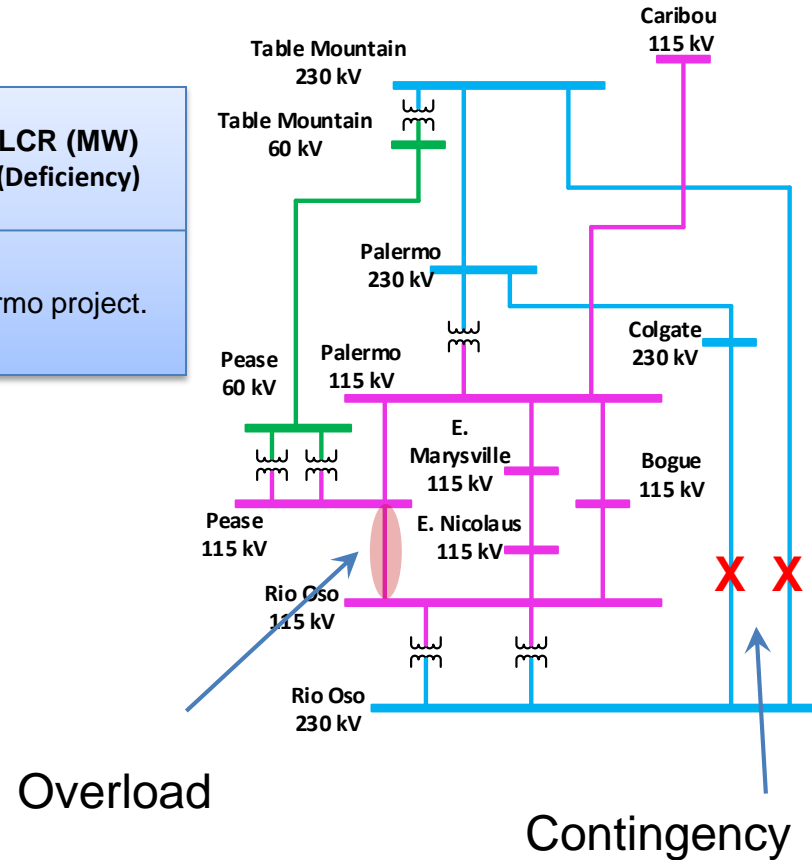
South of Rio Oso Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2022	P6	Rio Oso – Atlantic 230 kV	Rio Oso – Gold Hill 230 kV Rio Oso – Brighton 230 kV	256
2026	P6	Rio Oso – Atlantic 230 kV	Rio Oso – Gold Hill 230 kV Rio Oso – Brighton 230 kV	308



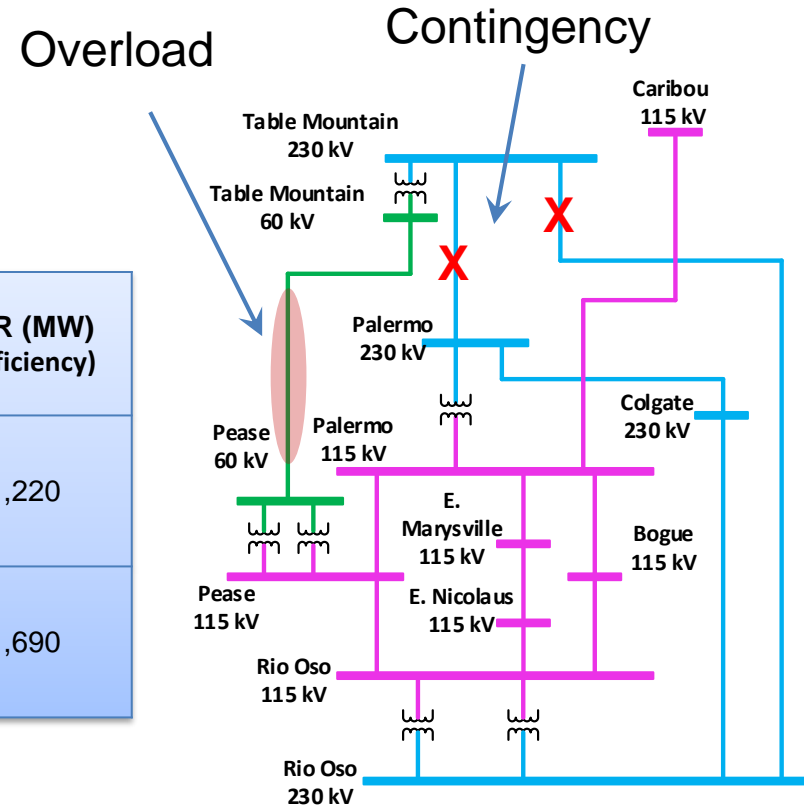
South of Palermo Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2022	All	No requirements due to implementation of South of Palermo project.		
2026				



South of Table Mountain Sub-Area: Requirements

Year	Category	Limiting Facility	Contingency	LCR (MW) (Deficiency)
2022	P6, P7	Table Mountain – Pease 60 kV	DCTL of Table Mtn. – Palermo and Table Mtn. Rio Oso 230 kV lines	1,220
2026	P6, P7	Table Mountain – Pease 60 kV	DCTL of Table Mtn. – Palermo and Table Mtn. Rio Oso 230 kV lines	1,690



Changes from 2021 to 2022

Sub-area	2021		2022	
	Load	LCR	Load	LCR
Pease	155	83	134	60
Placer	178	93	159	80
Drum - Rio Oso	N/A	700	N/A	748
Gold Hill - Drum	508	416	444	366
South of Rio Oso	N/A	665	N/A	256
South of Palermo	N/A	1,587	N/A	0
South of Table Mountain	N/A	1,821	N/A	1,220
Total	1,865	2,110	1,619	1,503

- The overall LCR requirement decreased in 2022 as compared to 2021 due to the drop in the load forecast and the implementation of the South of Palermo project.
- The LCR in Drum-Rio Oso sub-area increased due to reduction in the Rio Oso Bank #1 Transformer Rating

N/A=Flow-through area. No defined load pocket.

Changes from 2025 to 2026

Sub-area	2025		2026	
	Load	LCR	Load	LCR
Pease	161	0	154	80
Placer	179	93	194	127
Gold Hill - Drum	512	0	526	450
South of Rio Oso	N/A	223	N/A	308
South of Table Mountain	N/A	1,367	N/A	1,690
Total	1,918	1,412	1,880	2,021

- Although the overall load forecast for year 2026 dropped as compared to year 2025, the load forecast in the Placer and Gold Hill – Drum sub-areas increased.
- Overall LCR requirement is higher due to delay in East Marysville 115/60 kV and the Gold Hill 230/115 Transformer projects.

N/A=Flow-through area. No defined load pocket.

Sierra Area Total LCR Need

Study Year	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Need
2022	1,220	283	1,503
2026	1,690	331	2,021